

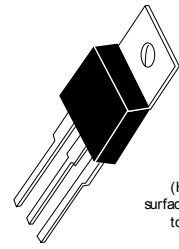
# IL79XXC SERIES

## THREE-TERMINAL NEGATIVE VOLTAGE REGULATORS

The IL7900 series of fixed output negative voltage regulators are intended as complements to the IL7800 series devices. These negative regulators are available in the same seven-voltage options as the IL7800 devices. In addition, one extra voltage option commonly employed in MECL systems is also available in the current series.

TO-220 AB

Pin 1. Input  
2. Ground  
3. Output

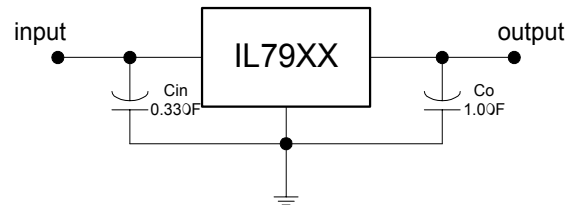


(Heatsink surface connected to Pin 2.)

Available in fixed output voltage options from -5.0 to -24 volts, these regulators employ current limiting, thermal shutdown, and safe-area compensation - making them remarkably rugged under most operating conditions. With adequate heatsinking they can deliver output currents in excess of 1.0 ampere.

- ◆ No External Components Required
- ◆ Internal Thermal Overload Protection
- ◆ Internal Short - Circuit Current Limiting
- ◆ Output Transistor Safe - Area Compensation
- ◆ Available in 4% Voltage Tolerance

### STANDARD APPLICATION



A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0V more negative even during the high point on the input ripple voltage.

XX - these two digits of the type number indicate voltage

Cin - is required if regulator is located an appreciable distance from power supply filter

Co - improves stability and transient response

Device type/nominal output voltage			
IL7905	5 V	IL7912	12 V
IL7905.2	5.2 V	IL7915	15 V
IL7906	6 V	IL7918	18 V
IL7908	8 V	IL7924	24 V

### Maximum ratings ( $T_A = +25\text{ }^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Input Voltage (-5.0V $\geq$ Vo $\geq$ -18V) (24 V)	$V_I$	-35 -40	Vdc
Power Dissipation Plastic Package $T_A = +25\text{ }^\circ\text{C}$ Derate above $T_A = +25\text{ }^\circ\text{C}$ $T_c = +25\text{ }^\circ\text{C}$ Derate above $T_c = +95\text{ }^\circ\text{C}$	PD $1/R_{\theta JA}$ PD $1/R_{\theta JA}$	Internally Limited 15.4 Internally Limited 200	Watts $\text{mW}/^\circ\text{C}$ Watts $\text{mW}/^\circ\text{C}$
Storage Junction Temperature Rang	Tstg	-65 to +150	$^\circ\text{C}$
Operating Junction Temperature Rang	TJ	0 to +150	$^\circ\text{C}$

## IL79XXC SERIES

### IL7905

#### Electrical characteristics

( $V_i = -10V$ ,  $I_o = 500mA$ ,  $0^\circ C < T_j < +125^\circ C$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ( $T_j = +25^\circ C$ )	$V_o$	-4.8	-5.0	-5.2	Vdc
Line Regulation (Note 1) ( $T_j = +25^\circ C$ , $I_o = 100mA$ ) $-7.0Vdc \geq V_i \geq -25Vdc$ $-8.0Vdc \geq V_i \geq -12Vdc$	Regline	-	7.0 2.0	50 25	mV
( $T_j = +25^\circ C$ , $I_o = 500mA$ ) $-7.0Vdc \geq V_i \geq -25Vdc$ $-8.0Vdc \geq V_i \geq -12Vdc$		-	35 8.0	100 50	
Load Regulation ( $T_j = +25^\circ C$ , Note 1) $5.0mA \leq I_o \leq 1.5A$ $250mA \leq I_o \leq 750mA$	Regload	-	11 4.0	100 50	mV
Output Voltage $5.0mA \leq I_o \leq 1.0A$ , $P_o \leq 15W$ $-7.0Vdc \geq V_i \geq -25Vdc$	$V_o$	-4.75	-	-5.25	Vcd
Input Bias Current ( $T_j = +25^\circ C$ )	$I_{IB}$	-	4.3	8.0	mA
Input Bias Current Change $-7.0Vdc \geq V_i \geq -25Vdc$ $5.0mA \leq I_o \leq 1.0A$	$\Delta I_{IB}$	-	-	1.3 0.5	mA
Output Noise Voltage ( $T_A = +25^\circ C$ ) $10Hz \leq f \leq 100kHz$	$e_{on}$	-	40	-	$\mu V$
Ripple Rejection ( $I_o = 20mA$ , $f = 120Hz$ )	RR	-	70	-	dB
Dropout Voltage ( $I_o = 1.0A$ , $T_j = +25^\circ C$ )	$V_i - V_o$	-	2.0	-	Vdc
Average Temperature Coefficient of Output Voltage $I_o = 5.0mA$ , $0^\circ C < T_j < +125^\circ C$	$DV_o/DT$	-	-1.0	-	$mV/^\circ C$

### IL7905.2

#### Electrical characteristics

( $V_i = -10V$ ,  $I_o = 500mA$ ,  $0^\circ C < T_j < +125^\circ C$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ( $T_j = +25^\circ C$ )	$V_o$	-5.0	-5.2	-5.4	Vdc
Line Regulation (Note 1) ( $T_j = +25^\circ C$ , $I_o = 100mA$ ) $-7.2Vdc \geq V_i \geq -25Vdc$ $-8.0Vdc \geq V_i \geq -12Vdc$	Regline	-	8.0 2.2	52 27	mV
( $T_j = +25^\circ C$ , $I_o = 500mA$ ) $-7.2Vdc \geq V_i \geq -25Vdc$ $-8.0Vdc \geq V_i \geq -12Vdc$		-	37 8.5	105 52	
Load Regulation ( $T_j = +25^\circ C$ , Note 1) $5.0mA \leq I_o \leq 1.5A$ $250mA \leq I_o \leq 750mA$	Regload	-	12 4.5	105 52	mV
Output Voltage $5.0mA \leq I_o \leq 1.0A$ , $P_o \leq 15W$ $-7.2Vdc \geq V_i \geq -20Vdc$	$V_o$	-4.95	-	-5.45	Vcd
Input Bias Current ( $T_j = +25^\circ C$ )	$I_{IB}$	-	4.3	8.0	mA
Input Bias Current Change $-7.2Vdc \geq V_i \geq -25Vdc$ $5.0mA \leq I_o \leq 1.5A$	$\Delta I_{IB}$	-	-	1.3 0.5	mA
Output Noise Voltage ( $T_A = +25^\circ C$ ) $10Hz \leq f \leq 100kHz$	$e_{on}$	-	42	-	$\mu V$
Ripple Rejection ( $I_o = 20mA$ , $f = 120Hz$ )	RR	-	68	-	dB
Dropout Voltage ( $I_o = 1.0A$ , $T_j = +25^\circ C$ )	$V_i - V_o$	-	2.0	-	Vdc
Average Temperature Coefficient of Output Voltage $I_o = 5.0mA$ , $0^\circ C < T_j < +125^\circ C$	$DV_o/V_o$	-	-1.0	-	$mV/^\circ C$

Note:

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_o$  due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

## IL79XXC SERIES

### IL7906

#### Electrical characteristics

( $V_i = -11V$ ,  $I_o = 500mA$ ,  $0^\circ C < T_j < +125^\circ C$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ( $T_j = +25^\circ C$ )	$V_o$	-5.75	-6.0	-6.25	Vdc
Line Regulation (Note 1) ( $T_j = +25^\circ C$ , $I_o = 100mA$ ) $-8.0Vdc \geq V_i \geq -25Vdc$ $-9.0Vdc \geq V_i \geq -13Vdc$	Regline	-	9.0 3.0	60 30	mV
( $T_j = +25^\circ C$ , $I_o = 500mA$ ) $-8.0Vdc \geq V_i \geq -25Vdc$ $-9.0Vdc \geq V_i \geq -13Vdc$		-	43 10	120 60	
Load Regulation ( $T_j = +25^\circ C$ , Note 1) $5.0mA \leq I_o \leq 1.5A$ $250mA \leq I_o \leq 750mA$	Regload	-	13 5.0	120 60	mV
Output Voltage $5.0mA \leq I_o \leq 1.0A$ , $P_o \leq 15W$ $-8.0Vdc \geq V_i \geq -21Vdc$	$V_o$	-5.7	-	-6.3	Vcd
Input Bias Current ( $T_j = +25^\circ C$ )	$I_{IB}$	-	4.3	8.0	mA
Input Bias Current Change $-8.0Vdc \geq V_i \geq -25Vdc$ $5.0mA \leq I_o \leq 1.5A$	$\Delta I_{IB}$	-	-	1.3 0.5	mA
Output Noise Voltage ( $T_A = +25^\circ C$ ) $10Hz \leq f \leq 100kHz$	$e_{on}$	-	45	-	$\mu V$
Ripple Rejection ( $I_o = 20mA$ , $f = 120Hz$ )	RR	-	65	-	dB
Dropout Voltage ( $I_o = 1.0A$ , $T_j = +25^\circ C$ )	$V_i - V_o$	-	2.0	-	Vdc
Average Temperature Coefficient of Output Voltage $I_o = 5.0mA$ , $0^\circ C < T_j < +125^\circ C$	$DV_o/V_o$	-	-1.0	-	$mV/^\circ C$

### IL7908

#### Electrical characteristics

( $V_i = -14V$ ,  $I_o = 500mA$ ,  $0^\circ C < T_j < +125^\circ C$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ( $T_j = +25^\circ C$ )	$V_o$	-7.7	-8.0	-8.3	Vdc
Line Regulation (Note 1) ( $T_j = +25^\circ C$ , $I_o = 100mA$ ) $-10.5Vdc \geq V_i \geq -25Vdc$ $-11Vdc \geq V_i \geq -17Vdc$	Regline	-	12 5.0	80 40	mV
( $T_j = +25^\circ C$ , $I_o = 500mA$ ) $-10.5Vdc \geq V_i \geq -25Vdc$ $-11Vdc \geq V_i \geq -17Vdc$		-	50 22	160 80	
Load Regulation ( $T_j = +25^\circ C$ , Note 1) $5.0mA \leq I_o \leq 1.5A$ $250mA \leq I_o \leq 750mA$	Regload	-	26 9.0	160 80	mV
Output Voltage $5.0mA \leq I_o \leq 1.0A$ , $P_o \leq 15W$ $-10.5Vdc \geq V_i \geq -23Vdc$	$V_o$	-7.6	-	-8.4	Vcd
Input Bias Current ( $T_j = +25^\circ C$ )	$I_{IB}$	-	4.3	8.0	mA
Input Bias Current Change $-10.5Vdc \geq V_i \geq -25Vdc$ $5.0mA \leq I_o \leq 1.5A$	$\Delta I_{IB}$	-	-	1.0 0.5	mA
Output Noise Voltage ( $T_A = +25^\circ C$ ) $10Hz \leq f \leq 100kHz$	$e_{on}$	-	52	-	$\mu V$
Ripple Rejection ( $I_o = 20mA$ , $f = 120Hz$ )	RR	-	62	-	dB
Dropout Voltage ( $I_o = 1.0A$ , $T_j = +25^\circ C$ )	$V_i - V_o$	-	2.0	-	Vdc
Average Temperature Coefficient of Output Voltage $I_o = 5.0mA$ , $0^\circ C < T_j < +125^\circ C$	$DV_o/V_o$	-	-1.0	-	$mV/^\circ C$

Note:

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_o$  due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

## IL79XXC SERIES

### IL7915

#### Electrical characteristics

( $V_I = -23V$ ,  $I_o = 500mA$ ,  $0^\circ C < T_J < +125^\circ C$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ( $T_J = +25^\circ C$ )	$V_o$	-14.4	-15	-15.6	Vdc
Line Regulation (Note 1) ( $T_J = +25^\circ C$ , $I_o = 100mA$ ) $-17.5Vdc \geq V_I \geq -30Vdc$ $-20Vdc \geq V_I \geq -26Vdc$	Regline	-	14 6.0	150 75	mV
( $T_J = +25^\circ C$ , $I_o = 500mA$ ) $-17.5Vdc \geq V_I \geq -30Vdc$ $-20Vdc \geq V_I \geq -26Vdc$		-	57 27	300 150	
Load Regulation ( $T_J = +25^\circ C$ , Note 1) $5.0mA \leq I_o \leq 1.5A$ $250mA \leq I_o \leq 750mA$	Regload	-	68 25	300 150	mV
Output Voltage $5.0mA \leq I_o \leq 1.0A$ , $P_o \leq 15W$ $-17.5Vdc \geq V_I \geq -30Vdc$	$V_o$	-14.25	-	-15.75	Vcd
Input Bias Current ( $T_J = +25^\circ C$ )	$I_{IB}$	-	4.4	8.0	mA
Input Bias Current Change $-17.5Vdc \geq V_I \geq -30Vdc$ $5.0mA \leq I_o \leq 1.0A$	$\Delta I_{IB}$	-	-	1.0 0.5	mA
Output Noise Voltage ( $T_A = +25^\circ C$ ) $10Hz \leq f \leq 100kHz$	$e_{on}$	-	90	-	$\mu V$
Ripple Rejection ( $I_o = 20mA$ , $f = 120Hz$ )	RR	-	60	-	dB
Dropout Voltage ( $I_o = 1.0A$ , $T_J = +25^\circ C$ )	$V_I - V_o$	-	2.0	-	Vdc
Average Temperature Coefficient of Output Voltage $I_o = 5.0mA$ , $0^\circ C < T_J < +125^\circ C$	$DV_o/V_o$	-	-1.0	-	$mV/^\circ C$

### IL7912

#### Electrical characteristics

( $V_I = -19V$ ,  $I_o = 500mA$ ,  $0^\circ C < T_J < +125^\circ C$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ( $T_J = +25^\circ C$ )	$V_o$	-11.5	-12	-12.5	Vdc
Line Regulation (Note 1) ( $T_J = +25^\circ C$ , $I_o = 100mA$ ) $-14.5Vdc \geq V_I \geq -30Vdc$ $-16Vdc \geq V_I \geq -22Vdc$	Regline	-	13 6.0	120 60	mV
( $T_J = +25^\circ C$ , $I_o = 500mA$ ) $-14.5Vdc \geq V_I \geq -30Vdc$ $-16Vdc \geq V_I \geq -22Vdc$		-	55 24	240 120	
Load Regulation ( $T_J = +25^\circ C$ , Note 1) $5.0mA \leq I_o \leq 1.5A$ $250mA \leq I_o \leq 750mA$	Regload	-	46 17	240 120	mV
Output Voltage $5.0mA \leq I_o \leq 1.0A$ , $P_o \leq 15W$ $-14.5Vdc \geq V_I \geq -27Vdc$	$V_o$	-11.4	-	-12.6	Vcd
Input Bias Current ( $T_J = +25^\circ C$ )	$I_{IB}$	-	4.4	8.0	mA
Input Bias Current Change $-14.5Vdc \geq V_I \geq -30Vdc$ $5.0mA \leq I_o \leq 1.5A$	$\Delta I_{IB}$	-	-	1.0 0.5	mA
Output Noise Voltage ( $T_A = +25^\circ C$ ) $10Hz \leq f \leq 100kHz$	$e_{on}$	-	75	-	$\mu V$
Ripple Rejection ( $I_o = 20mA$ , $f = 120Hz$ )	RR	-	61	-	dB
Dropout Voltage ( $I_o = 1.0A$ , $T_J = +25^\circ C$ )	$V_I - V_o$	-	2.0	-	Vdc
Average Temperature Coefficient of Output Voltage $I_o = 5.0mA$ , $0^\circ C < T_J < +125^\circ C$	$DV_o/V_o$	-	-1.0	-	$mV/^\circ C$

Note:

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_o$  due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

## IL79XXC SERIES

### IL7918

#### Electrical characteristics

( $V_I = -27V$ ,  $I_o = 500mA$ ,  $0^\circ C < T_J < +125^\circ C$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ( $T_J = +25^\circ C$ )	$V_o$	-11.5	-12	-12.5	Vdc
Line Regulation (Note 1) ( $T_J = +25^\circ C$ , $I_o = 100mA$ ) $-21Vdc \geq V_I \geq -33Vdc$ $-24Vdc \geq V_I \geq -30Vdc$	Regline	-	25 10	180 90	mV
( $T_J = +25^\circ C$ , $I_o = 500mA$ ) $-21Vdc \geq V_I \geq -33Vdc$ $-24Vdc \geq V_I \geq -30Vdc$		-	90 50	360 180	
Load Regulation ( $T_J = +25^\circ C$ , Note 1) $5.0mA \leq I_o \leq 1.5A$ $250mA \leq I_o \leq 750mA$	Regload	-	110 55	360 180	mV
Output Voltage $5.0mA \leq I_o \leq 1.0A$ , $P_o \leq 15W$ $-21Vdc \geq V_I \geq -33Vdc$	$V_o$	-17.1	-	-18.9	Vcd
Input Bias Current ( $T_J = +25^\circ C$ )	$I_{IB}$	-	4.5	8.0	mA
Input Bias Current Change $-21Vdc \geq V_I \geq -33Vdc$ $5.0mA \leq I_o \leq 1.5A$	$\Delta I_{IB}$	-	-	1.0 0.5	mA
Output Noise Voltage ( $T_A = +25^\circ C$ ) $10Hz \leq f \leq 100kHz$	$e_{on}$	-	110	-	$\mu V$
Ripple Rejection ( $I_o = 20mA$ , $f = 120Hz$ )	RR	-	59	-	dB
Dropout Voltage ( $I_o = 1.0A$ , $T_J = +25^\circ C$ )	$V_I - V_o$	-	2.0	-	Vdc
Average Temperature Coefficient of Output Voltage $I_o = 5.0mA$ , $0^\circ C < T_J < +125^\circ C$	$DV_o/V_o$	-	-1.0	-	$mV/^\circ C$

### IL7924

#### Electrical characteristics

( $V_I = -33V$ ,  $I_o = 500mA$ ,  $0^\circ C < T_J < +125^\circ C$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ( $T_J = +25^\circ C$ )	$V_o$	-11.5	-12	-12.5	Vdc
Line Regulation (Note 1) ( $T_J = +25^\circ C$ , $I_o = 100mA$ ) $-27Vdc \geq V_I \geq -38Vdc$ $-30Vdc \geq V_I \geq -36Vdc$	Regline	-	31 14	240 120	mV
( $T_J = +25^\circ C$ , $I_o = 500mA$ ) $-27Vdc \geq V_I \geq -38Vdc$ $-30Vdc \geq V_I \geq -36Vdc$		-	118 70	480 240	
Load Regulation ( $T_J = +25^\circ C$ , Note 1) $5.0mA \leq I_o \leq 1.5A$ $250mA \leq I_o \leq 750mA$	Regload	-	150 85	480 240	mV
Output Voltage $5.0mA \leq I_o \leq 1.0A$ , $P_o \leq 15W$ $-27Vdc \geq V_I \geq -38Vdc$	$V_o$	-22.8	-	-25.2	Vcd
Input Bias Current ( $T_J = +25^\circ C$ )	$I_{IB}$	-	4.6	8.0	mA
Input Bias Current Change $-27Vdc \geq V_I \geq -38Vdc$ $5.0mA \leq I_o \leq 1.5A$	$\Delta I_{IB}$	-	-	1.0 0.5	mA
Output Noise Voltage ( $T_A = +25^\circ C$ ) $10Hz \leq f \leq 100kHz$	$e_{on}$	-	170	-	$\mu V$
Ripple Rejection ( $I_o = 20mA$ , $f = 120Hz$ )	RR	-	56	-	dB
Dropout Voltage ( $I_o = 1.0A$ , $T_J = +25^\circ C$ )	$V_I - V_o$	-	2.0	-	Vdc
Average Temperature Coefficient of Output Voltage $I_o = 5.0mA$ , $0^\circ C < T_J < +125^\circ C$	$DV_o/V_o$	-	-1.0	-	$mV/^\circ C$

Note:

Load and line regulation are specified at constant junction temperature. Changes in  $V_o$  due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.